

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT		Docket Number 10644/61501	
Application Number 10/822,774	Filing Date April 13, 2004	Examiner Not Yet Assigned	Art Unit 2811
Invention Title HIGH EFFICIENCY ORGANIC PHOTOVOLTAIC CELLS EMPLOYING HYBRIDIZED MIXED-PLANAR HETEROJUNCTIONS		Inventor(s) FORREST et al.	

Address' to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450 I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

Signature: Thomas F. Meagher (Reg. No. 29,831)

- 1. In accordance with the duty of disclosure under 37 C.F.R. § 1.56 and in conformance with the procedures of 37 C.F.R. §§ 1.97 and 1.98 and M.P.E.P. § 609, attorneys for Applicants hereby bring the following references to the attention of the Examiner. The references are listed on the attached modified PTO Form No. 1449. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.
- 2. A copy of each patent, publication or other information listed on the modified PTO form 1449 is enclosed, unless otherwise indicated.
- 3. It is believed that no fees are due in connection with this Information Disclosure Statement. However, should any fees be due, the Commissioner is authorized to charge Deposit Account No. 11-0600 for such fees. A duplicate copy of this communication is enclosed for charging purposes.

Dated: 7/6/04

By:

Thomas F. Meagher (Reg. No. 29.831)

KENYON & KENYON

One Broadway

New York, NY 10004

Customer No. 26646

© Kenyon & Kenyon 2003



U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT		Docket Number 10644/61501	
Application Number 10/822,774	Filing Date April 13, 2004	Examiner Not Yet Assigned	Art Unit 2811
Invention Title HIGH EFFICIENCY ORGANIC PHOTOVOLTAIC CELLS EMPLOYING HYBRIDIZED MIXED-PLANAR HETEROJUNCTIONS		Inventor(s) FORREST et al.	

Address to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

Date:_____

Thomas F. Meagher (Reg. No. 29.8

- 1. In accordance with the duty of disclosure under 37 C.F.R. § 1.56 and in conformance with the procedures of 37 C.F.R. §§ 1.97 and 1.98 and M.P.E.P. § 609, attorneys for Applicants hereby bring the following references to the attention of the Examiner. The references are listed on the attached modified PTO Form No. 1449. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.
- 2. A copy of each patent, publication or other information listed on the modified PTO form 1449 is enclosed, unless otherwise indicated.
- 3. It is believed that no fees are due in connection with this Information Disclosure Statement. However, should any fees be due, the Commissioner is authorized to charge Deposit Account No. 11-0600 for such fees. A duplicate copy of this communication is enclosed for charging purposes.

Dated: 7/6/04

By:

Thomas F. Meagher (Reg. No. 29,831)

KENYON & KENYON

One Broadway

New York, NY 10004

Customer No. 26646

© Kenyon & Kenyon 2003

DOCKET NO.
10644/61501

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT
PTO-1449

DOCKET NO.
10644/61501

APPLICANT
FORREST et al.

FILING DATE
April 13, 2004

To be assigned

U. S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	PATENT DATE	NAME	CLASS	SUBCLASS	FILING DATE
					_	

FOREIGN PATENT DOCUMENTS

						TRANSL	ATION
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	YES	NO

OTHER DOCUMENTS

EXAMINER INITIAL	AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.
	Peumans et al., "Small Molecular Weight Organic Thin-Film Photodetectors and Solar Cells," Journal of Applied Physics, Vol. 93, No. 7, pp. 3693-3723 (April 1, 2003).
	C. W. Tang, "Two-layer organic photovoltaic cell", Appl. Phys. Lett., Vol. 48, No. 2, pp. 183-185 (January 1986).
	A. Yakimov, et al., "High photovoltage multiple-heterojunction organic solar cells incorporating interfacial metallic nanoclusters", Appl. Phys. Lett., Volume 80, Number 9, pp. 1667-1669 (March 4, 2002).
	P. Peumans et al., "Very-high-efficiency double-heterostructure copper phthalocyanine/C60 photovoltaic cells", Appl. Phys. Lett., Volume 79, Number 1, pp. 126-128 (2 July 2001).
	S. E. Shaheen et al., "2.5% efficient organic plastic solar cells", Appl. Phys. Lett., Volume 78, Number 6, pp. 841-843 (February 5, 2001).
	P. Peumans et al., "Efficient bulk heterojunction photovoltaic cells using small-molecular-weight organic thin films", Nature, Volume 425, pp. 158-162 (September 11, 2003).
	D. Gebeyehu et al., "Bulk-heterojunction photovoltaic devices based on donor-acceptor organic small molecule blends", <i>Solar Energy Mater. Solar Cells</i> , 79, pp. 81-92 (2003).
	Xue et al., "4.2% efficient organic photovoltaic cells with low series resistances", Appl. Phys. Lett., Volume 84, Number 16, pp. 3013-3015 (April 19, 2004).

EXAMINER INITIAL	AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.
	M. Hiramoto, et al., "Three-layered organic solar cell with a photoactive interlayer of codeposited pigments", Appl. Phys. Lett. 58 (10), pp. 1062-1064 (March 11, 1991).
	Forrest, "Ultrathin Organic Films Grown by Organic Molecular Beam Deposition and Related Techniques", <i>Chem Rev.</i> , Volume 97, No. 6, pp. 1793-1896 (1997).
	Sullivan, et al., "Influence of codeposition on the performance of CuPc-C60 heterojunction photovoltaic devices", <i>Appl. Phys. Lett.</i> , Volume 84, Number 7, pp. 1210-1212 (February 16, 2004).
	Burrows et al., "Relationship between electroluminescence and current transport in organic heterojunction light-emitting devices", <i>J. Appl. Phys.</i> 79(10), pp. 7991-8006 (May 15, 1996).
	Xue et al., "Carrier transport in multilayer organic photodetectors: II. Effects of anode preparation", J. Appl. Phys., Volume 95, No. 4, pp. 1869-1877 (February 15, 2004).
	Paasch et al., "Variable range hopping as possible origin of a universal relation between conductivity and mobility in disordered organic semiconductors", <i>Synthetic Metals</i> , 132, pp. 97-104 (2002).
	G Ruani et al., "Weak instrinsic charge transfer complexes: A new route for developing wide spectrum organic photovoltaic cells", <i>J. Chem Phys.</i> , Volume 116, Number 4, pp. 1713-1719 (January 22, 2002).
	M. Hiramoto, et al., "p-i-n like behavior in three-layered organic solar cells having a co-deposited interlayer of pigments", J. Appl. Phys., 72 (8), pp. 3781-3787, 15 October 1992.
	G. Yu, et al., "Polymer Photovoltaic Cells: Enhanced efficiencies via a network of internal donor-acceptor heterojunctions", <u>Science</u> , Vol. 270, pp. 1789-1791 (December 15, 1995).
	F. Padinger, et al., "Effects of postproduction treatment on plastic solar cells", Adv. Funct. Mater., 13, No. 1, pp. 85-88 (January 2003).
	T. Tsuzuki, et al., "The effect of fullerene doping on photoelectric conversion using titanyl phthalocyanine and a perylene pigment", Solar Energy Mater. Solar Cells, 61, pp. 1-8, (2000).
	J. Rostalski, et al., "Monochromatic versus solar efficiencies of organic solar cells", Solar Energy Mater. Solar Cells, 61, pp. 87-95 (2000).
	Ch. Pannemann, et al., "Electrical characterisation of phthalocyanine-fullerene photovoltaic devices" Synth. Met., 121, pp. 1585-1586 (2001).
	Ot. E. Sielcken, et al., "Synthesis and Aggregation Behavior of Hosts Containing Phthalocyanine and Crown Either Subunits", J. Am. Chem. Soc., 109, pp. 4261-4265 (1987).
	V. Bulovic et al., "Study of localized and extended excitons in 3,4,9,10-perylenetetracarboxylic dianhydride (PTCDA) II. Photocurrent response at low electric fields", Chem. Phys. 210, pp. 13-25, 1996.
	B. A. Gregg et al., "Long-Range singlet energy transfer in perylene Bis(phenethylimide) films", J. Phys. Chem. B, 101, pp. 5362-5369, 1997.
	T. Stübinger et al., "Exciton diffusion and optical interference in organic donor-acceptor photovoltaic cells", J. Appl. Phys., Volume 90, Number 7, pp. 3632-3641, October 1, 2001.
	H. R. Kerp and E. E. van Faassen, "Photovoltaic yield from exciton dissociation in organic dye layers", Phys. Chem. Chem. Phys., 1999, 1, pp. 1761-1763.
	L. A. A. Pettersson et al., "Modeling photocurrent action spectra of photovoltaic devices based on organic thin films", J. Appl. Phys., Volume 86, Number 1, pp. 487-496, July 1, 1999.

EXAMINER INITIAL	AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.
	A. L. Burin et al., "Exciton migration and cathode quenching in organic light emitting diodes", J. Phys. Chem. A, 104, pp. 4704-4710, 2000.
	V. E. Choong et al., "Photoluminescence quenching of Alq3 by metal deposition: A surface analytical investigation", J. Vac. Sci. Technol. A 16 (3), pp. 1838-1841, May/June 1998.
	J. J. M. Halls et al., "Exciton diffusion and dissociation in a poly(p-phenylenevinylene)/C60 heterojunction photovoltaic cell", Appl. Phys. Lett. 68(22), pp. 3120-3122, May 27, 1996.
	M. Theander et al., "Photoluminescence quenching at a polythiophene/C60 heterojunction", Phys. Rev. B, Volume 61, Number 19, pp. 12 957-12 963, May 15, 2000.
	P. Peumans, et al., "Influence of Device Architecture and Interface Morphology on the Power Conversion Efficiency of Small Molecular Photovoltaic Cells", NCPV and Solar Program Review Meeting 2003, pp. 435-437.

EXAMINER	DATE CONSIDERED		
EXAMINER: Initial if citation considered, whether or not citation is in conformance with M.P.E.P. 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			